

APPLICATION

FOR UNITED STATES LETTERS PATENT

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, **Charles E. Holm**, a citizen of the United States, have
invented a new and useful submersible ice fishing troller system of which the
following is a specification:

1
2
3 **Submersible Ice Fishing Troller System**
4
5

6 **CROSS REFERENCE TO RELATED APPLICATIONS**

7 Not applicable to this application.
8
9

10 **STATEMENT REGARDING FEDERALLY**
11 **SPONSORED RESEARCH OR DEVELOPMENT**

12 Not applicable to this application.
13
14

15 **BACKGROUND OF THE INVENTION**
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17
18

19 **Field of the Invention**
20

21 The present invention relates generally to trolling devices and more specifically
22 it relates to a submersible ice fishing troller system for efficiently trolling a fishing
23 lure or bait beneath an ice surface and locating fish on sonar.
24
25

26 **Description of the Related Art**
27

28 Ice fishing is a popular sport in the northern states. Ice fishing involves the
29 drilling of an ice hole into the ice and then lowering a fishing line with a lure/bait

1 attached to the distal end thereof through the ice hole. The main problem with
2 conventional ice fishing techniques is that no movement of the bait/lure is achieved
3 other than an up/down vertical movement caused by the user raising/lowering their
4 rod.

5
6 Examples of patented devices which may be related to the present invention
7 include U.S. Patent 5,016,385 to Blease; U.S. Patent 5,185,950 to Hood; U.S. Patent
8 4,926,399 to Hickman; U.S. Patent 5,546,362 to Baumann et al.; U.S. Patent 5,627,802
9 to Langer; U.S. Patent 5,828,761 to Langer; U.S. Patent 5,887,376 to Currier et al.;
10 U.S. Patent 6,160,764 to Powell; U.S. Patent 6,421,301 to Scanlon; U.S. Patent
11 2002/0085452 to Scanlon; U.S. Patent 5,546,695 to Langer; U.S. Patent 5,461,815 to
12 Rodgers; U.S. Patent 4,888,747 to Williams; and U.S. Patent 4,509,287 to Hood.

13
14 While these devices may be suitable for the particular purpose to which they
15 address, they are not as suitable for efficiently trolling a fishing lure or bait beneath an
16 ice surface and none of them allow for the locating of fish. Conventional ice fishing
17 techniques do not allow the fisherman to actively move the lure/bait similar to trolling
18 on open water.

19
20 In these respects, the submersible ice fishing troller system according to the
21 present invention substantially departs from the conventional concepts and designs of
22 the prior art, and in so doing provides an apparatus primarily developed for the
23 purpose of efficiently trolling a fishing lure or bait beneath an ice surface.

1
2 **BRIEF SUMMARY OF THE INVENTION**
3

4 In view of the foregoing disadvantages inherent in the known types of trolling
5 devices now present in the prior art, the present invention provides a new submersible
6 ice fishing troller system construction wherein the same can be utilized for efficiently
7 trolling a fishing lure or bait beneath an ice surface.
8

9 The general purpose of the present invention, which will be described
10 subsequently in greater detail, is to provide a new submersible ice fishing troller
11 system that has many of the advantages of the trolling devices mentioned heretofore
12 and many novel features that result in a new submersible ice fishing troller system
13 which is not anticipated, rendered obvious, suggested, or even implied by any of the
14 prior art trolling devices, either alone or in any combination thereof.
15

16 To attain this, the present invention generally comprises a submersible unit in
17 communication with a control unit, a downrigger clip attached to the submersible unit,
18 a line release attached to the submersible unit, and sonar. An actuator unit
19 mechanically connected to the line release and remotely activated allows for selective
20 release of the fishing line from the line release after a fish has bitten. The submersible
21 unit automatically travels to the bottom of the ice after the line release has been
22 opened.
23

24 There has thus been outlined, rather broadly, the more important features of the
25 invention in order that the detailed description thereof may be better understood, and
26 in order that the present contribution to the art may be better appreciated. There are
27 additional features of the invention that will be described hereinafter and that will form
28 the subject matter of the claims appended hereto.
29

1 In this respect, before explaining at least one embodiment of the invention in
2 detail, it is to be understood that the invention is not limited in its application to the
3 details of construction and to the arrangements of the components set forth in the
4 following description or illustrated in the drawings. The invention is capable of other
5 embodiments and of being practiced and carried out in various ways. Also, it is to be
6 understood that the phraseology and terminology employed herein are for the purpose
7 of the description and should not be regarded as limiting.

8
9 A primary object of the present invention is to provide a submersible ice fishing
10 troller system that will overcome the shortcomings of the prior art devices.

11
12 A second object is to provide a submersible ice fishing troller system for
13 efficiently trolling a fishing lure or bait beneath an ice surface.

14
15 A further object is to provide a submersible ice fishing troller system for
16 locating fish beneath an ice surface.

17
18 Another object is to provide a submersible ice fishing troller system that is
19 simple to operate and utilize.

20
21 An additional object is to provide a submersible ice fishing troller system that
22 is capable of trolling within a body of water beneath an ice surface.

23
24 A further object is to provide a submersible ice fishing troller system that is
25 remotely operated.

26
27 Other objects and advantages of the present invention will become obvious to the
28 reader and it is intended that these objects and advantages are within the scope of the
29 present invention.

1

2 To the accomplishment of the above and related objects, this invention may be
3 embodied in the form illustrated in the accompanying drawings, attention being called
4 to the fact, however, that the drawings are illustrative only, and that changes may be
5 made in the specific construction illustrated and described within the scope of the
6 appended claims.

7

1
2 **BRIEF DESCRIPTION OF THE DRAWINGS**
3

4 Various other objects, features and attendant advantages of the present
5 invention will become fully appreciated as the same becomes better understood when
6 considered in conjunction with the accompanying drawings, in which like reference
7 characters designate the same or similar parts throughout the several views, and
8 wherein:
9

10 FIG. 1 is a side view of the present invention stored within a storage case.
11

12 FIG. 2 is a side view of the present invention illustrating the submersible unit
13 removed from the storage case.
14

15 FIG. 3 is a perspective view of the submersible unit.
16

17 FIG. 4 is a side view of the submersible unit.
18

19 FIG. 5 is a block diagram of the electrical components of the present invention.
20

21 FIG. 6a is a rear view of the submersible unit with the line release closed.
22

23 FIG. 6b is a rear view of the submersible unit with the line release opened.
24

25 FIG. 7 is a side view of the present invention beneath an ice surface with a
26 fishing lure and the fishing line attached to the downrigger clip for trolling.
27

1 FIG. 8a is a side view of the present invention beneath the ice surface with live
2 bait and the fishing line secured within the downrigger clip and the line release prior to
3 lowering bait.

4

5 FIG. 8b is a side view of the present invention beneath the ice surface with the
6 fishing line released from the downrigger clip, but within the line release and the live
7 bait lowered near the fish.

8

9 FIG. 8c is a side view of the present invention surfacing after the line release
10 has been actuated due to a fish biting.

11

12 FIG. 9a is a perspective view of the fishing line movably positioned within the
13 line release.

14

15 FIG. 9b is a perspective view of the fishing line non-movably positioned within
16 the downrigger clip.

17

18

1
2 **DETAILED DESCRIPTION OF THE INVENTION**
3

4 **A. *Overview***

5 Turning now descriptively to the drawings, in which similar reference
6 characters denote similar elements throughout the several views, FIGS. 1 through 9b
7 illustrate a submersible ice fishing troller system **10**, which comprises a submersible
8 unit **50** in communication with a control unit **40**, a downrigger clip **60** attached to the
9 submersible unit **50**, and a line release **70** attached to the submersible unit **50**. An
10 actuator unit **72** mechanically connected to the line release **70** allows for selective
11 release of the fishing line **14** from the line release **70** after a fish has bitten. The
12 submersible unit **50** automatically travels to the bottom of the ice after the line release
13 **70** has been opened.
14

15 **B. *Submersible Unit***

16 The submersible unit **50** is comprised of a miniature submarine structure that is
17 capable of being submerged and operated within cold-water environments. The
18 submersible unit **50** is preferably capable of lowering, rising, moving forward, moving
19 rearward and steering within a volume of water. The submersible unit **50** may be
20 comprised of various well known technologies utilized today to operate submersible
21 devices. The submersible unit **50** is preferably controlled by a control unit **40**,
22 however various automation features may be incorporated within the submersible unit
23 **50**.
24

25 An exemplary submersible unit **50** is illustrated in Figures 3 and 4 of the
26 drawings. The submersible unit **50** preferably has one or more control fins **54** at a rear
27 portion of the body with a propeller unit **52** at a front portion of the body. The control
28 fins **54** allow for controlling the steering of the submersible unit **50** while the propeller
29 unit **52** drives the submersible unit **50** within the water. Various other configurations

1 may be utilized to construct the submersible unit **50** to operate within a water
2 environment other than shown in the drawings.

3
4 The submersible unit **50** preferably includes a first sonar **51** and a second sonar
5 **53**. The first sonar **51** preferably faces downwardly from the submersible unit **50** for
6 determining the floor of the body of water and the location of fish. The second sonar
7 **53** preferably faces upwardly from the submersible unit **50** for determining the distance
8 beneath the surface ice of the body of water. The submersible unit **50** also preferably
9 contains a battery to minimize size of control cable.

10
11 The control unit **40** is in communication with the submersible unit **50** via
12 various communication means such as but not limited to radio communication and
13 electrical communication through a control cable **58**. A control cable **58** is preferably
14 utilized to allow for drawing of the submersible unit **50** back through the ice hole **16**
15 for reloading of the fishing line **14**, lure or bait **18** and maintenance. The individual
16 electrical components of the submersible unit **50** are in communication with the
17 control unit **40** whereby the user controls and monitors the same through the control
18 unit **40**.

19
20 The control unit **40** is preferably integrally formed within a storage case **20** as
21 best shown in Figure 1 of the drawings. The storage case **20** preferably has a case
22 handle **22** for transportation purposes. The storage case **20** preferably is capable of
23 storing and recharging the submersible unit **50** when not in use as shown in Figure 1 of
24 the drawings.

25
26 A battery **43** and a charger **42** are preferably in electrical communication with
27 the control unit **40** for providing electrical power to the system as shown in Figure 5 of
28 the drawings. It can be appreciated that the control unit **40** and submersible unit **50**
29 may be electrically powered by other means than shown in the drawings.

1
2 The storage case 20 preferably includes a fish indicator display 46 for
3 displaying the location of fish and the lake bottom as measured by the first sonar 51.
4 The storage case 20 further preferably includes a surface depth display 48 for
5 displaying the depth of the submersible unit 50 in relation to the ice layer as measured
6 by the second sonar 53. A joystick 44 or other control device allows the user to
7 control the movements of the submersible unit 50 beneath the surface ice. It can be
8 appreciated that various other technologies may be utilized upon the present invention
9 such as but not limited to underwater cameras.

10
11 A cable reel 30 is positioned within the storage case 20 for dispensing the
12 control cable 58 through a cable aperture 24 within the storage case 20. A reel handle
13 32 attached to the cable reel 30 allows the user to rotate the cable reel 30 when
14 dispensing or retracting the control cable 58. One or more guide members 34 may be
15 utilized near the cable reel 30 for ensuring that the control cable 58 is properly fed into
16 and from the cable reel 30.

17
18 The control unit 40 has a release switch 49 for allowing a user to control the
19 opening of the line release 70 as shown in Figures 9a and 9b of the drawings. The
20 release switch 49 is in communication with the control unit 40. When the release
21 switch 49 is closed, the control unit 40 sends a signal to the submersible unit 50 which
22 then activates the actuator unit 72 to open the jaws of the line release 70. The
23 submersible unit 50 preferably automatically travels to the bottom of the ice after the
24 line release 70 has been opened.

25
26 **C. Line Release**

27 The line release 70 is attached to the submersible unit 50 as shown in Figures 3,
28 4, 6a and 6b of the drawings. The line release 70 preferably has a first jaw and a

1 second jaw for selectively releasing a fishing line 14. The line release 70 is utilized
2 with live bait 18 to allow the fishing line 14 to freely pass through the line release 70.
3

4 The line release 70 includes an actuator unit 72 mechanically connected to first
5 jaw and the second jaw for manipulating the first jaw and the second jaw. The first
6 jaw and the second jaw preferably form an enclosed circular structure when closed as
7 shown in Figures 6a and 9a of the drawings. The first jaw and the second each
8 preferably have a C-shaped structure as further shown in Figures 6b and 9b of the
9 drawings.
10

11 As shown in Figures 3 and 4 of the drawings, the line release 70 is attached to a
12 rear portion of the submersible unit 50 away from the propeller unit 52. This allows
13 for the fishing line 14 to be pulled through the water without interference with the
14 propeller unit 52. As further shown in Figures 3 and 4 of the drawings, the line release
15 70 is preferably attached to one of a plurality of control fins 54 of the submersible unit
16 50, preferably the lowest portion of the control fins 54.
17

18 ***D. Downrigger Clip***

19 Figures 3 and 4 illustrate a downrigger clip 60 attached to the submersible unit
20 50. The downrigger clip 60 is preferably attached to a rear portion of the submersible
21 unit 50 and may have any structure commonly utilized within the downrigger industry.
22 The downrigger clip 60 frictionally engages the fishing line 14 for supporting a lure 18
23 while pulling the lure 18 through the water.
24

25 ***E. Operation***

26 If the user is utilizing live bait 18, the user first attaches the fishing line 14 to
27 the downrigger clip 60 approximately 18 inches from the bait, then opens the jaws of
28 the line release 70 and inserts the fishing line 14 within the line release 70. The jaws
29 may be manually opened or electronically opened. The user then closes the jaws of the

1 line release 70 and lowers the submersible unit 50 through the ice hole 16 within the
2 ice layer. The user then controls the position of the submersible unit 50 directly under
3 the ice to locate fish using the control unit 40. When fish are located via sonar, the
4 user then tugs upon the fishing line 14 once to release the fishing line 14 from the
5 downrigger clip 60. The fishing line 14 is then let out to allow the live bait 18 to be
6 lowered to the fish. When a fish bites, the user allows the fish to "run" with the
7 fishing line 14 a finite distance as the fishing line 14 freely passes through the line
8 release 70. The user then selects the release switch 49 thereby activating the actuator
9 unit 72 which opens the jaws of the line release 70. The fisherman then plays and
10 captures the fish. The fisherman then pulls the submersible unit 50 through the ice
11 hole 16 for reattaching the fishing line 14 of the fishing rod 12.

12
13 If the user is utilizing a lure, the user simply attaches the fishing line 14 within
14 the jaws of the downrigger clip 60 as shown in Figure 9b of the drawings. The user
15 then lowers the submersible unit 50 through the ice hole 16 within the ice layer. The
16 user then controls the position of the submersible unit 50 using the control unit 40.
17 When a fish bites, this removes the fishing line 14 from the downrigger clip 60. The
18 user then selects the release switch 49 thereby causing the submersible unit 50 to
19 automatically surface to allow for the fisherman to bring the fish into the ice hole 16
20 unobstructed. The fisherman then pulls the submersible unit 50 through the ice hole
21 16 for reattaching the fishing line 14 of the fishing rod 12.

22
23 As to a further discussion of the manner of usage and operation of the present
24 invention, the same should be apparent from the above description. Accordingly, no
25 further discussion relating to the manner of usage and operation will be provided.

26
27 With respect to the above description then, it is to be realized that the optimum
28 dimensional relationships for the parts of the invention, to include variations in size,
29 materials, shape, form, function and manner of operation, assembly and use, are

1 deemed to be within the expertise of those skilled in the art, and all equivalent
2 structural variations and relationships to those illustrated in the drawings and
3 described in the specification are intended to be encompassed by the present invention.
4

5 Therefore, the foregoing is considered as illustrative only of the principles of
6 the invention. Further, since numerous modifications and changes will readily occur to
7 those skilled in the art, it is not desired to limit the invention to the exact construction
8 and operation shown and described, and accordingly, all suitable modifications and
9 equivalents may be resorted to, falling within the scope of the invention.
10

☐ **ENVIRONMENTAL ELEMENTS**

- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐

☐ **10. Submersible Ice Fishing Troller System**

- ☐ 11.
- ☐ 12. Fishing Rod
- ☐ 13.
- ☐ 14. Fishing Line
- ☐ 15.
- ☐ 16. Ice Hole
- ☐ 17.
- ☐ 18. Lure/Bait
- ☐ 19.

☐ **20. Storage Case**

- ☐ 21.
- ☐ 22. Case Handle
- ☐ 23.
- ☐ 24. Cable Aperture
- ☐ 25.
- ☐ 26.
- ☐ 27.
- ☐ 28.
- ☐ 29.

☐ **30. Cable Reel**

- ☐ 31.
- ☐ 32. Reel Handle
- ☐ 33.
- ☐ 34. Guide Members
- ☐ 35.
- ☐ 36.
- ☐ 37.
- ☐ 38.
- ☐ 39.

☐ **40. Control Unit**

- ☐ 41.
- ☐ 42. Charger
- ☐ 43. Battery
- ☐ 44. Joystick
- ☐ 45.
- ☐ 46. Fish Indicator Display
- ☐ 47.
- ☐ 48. Surface Depth Display
- ☐ 49. Release Switch

☐ **50. Submersible Unit**

- ☐ 51. First Sonar
- ☐ 52. Propeller Unit
- ☐ 53. Second Sonar
- ☐ 54. Control Fins
- ☐ 55. Keel
- ☐ 56.
- ☐ 57.
- ☐ 58. Control Cable
- ☐ 59.

☐ **60. Downrigger Clip**

- ☐ 61.
- ☐ 62.
- ☐ 63.
- ☐ 64.
- ☐ 65.
- ☐ 66.
- ☐ 67.
- ☐ 68.
- ☐ 69.

☐ **70. Line Release**

- ☐ 71.
- ☐ 72. Actuator Unit
- ☐ 73.
- ☐ 74.
- ☐ 75.
- ☐ 76.
- ☐ 77.
- ☐ 78.
- ☐ 79.